

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN
Department of Electrical and Computer Engineering

ECE 498MH SIGNAL AND IMAGE ANALYSIS

Homework 2

Fall 2014

Assigned: 2/14/2017

Due: 2/14/2017

Reading: 1-40

Problem 2.1

$$T_0 = \frac{1}{2}, \quad \Omega_0 = 4\pi$$

$$X_k = \frac{2(-1)^k}{\pi(1-4k^2)}$$

Problem 2.2

$$T_0 = \frac{1}{200}, \quad \Omega_0 = 400\pi$$

$$X_k = \begin{cases} 1 - \frac{2}{\pi} & k = 0 \\ \frac{-2}{\pi(1-4k^2)} & k \neq 0 \end{cases}$$

Problem 2.3

$$T_0 = \frac{1}{50}, \quad \Omega_0 = 100\pi$$

$$X_k = \begin{cases} \frac{1}{e^{-1}-1} & k = 0 \\ \frac{e^{-1}-1}{1+k^2\pi^2} & k \neq 0 \end{cases}$$